

What is claimed is:

1. A method for continuous preparation of a hydrous zirconia sol dispersed by nanometer-sized spherical hydrous zirconia particles having an average diameter(d_p) of 1~250 nm, which method comprises supplying the aqueous solution of a zirconium salt at a concentration of 0.001~0.2 mole/l to a reactor consisting of one or more than two reaction tubes, and then irradiating microwave to the stream of the said aqueous solution in the reactor so that the said solution may be heated in a flow state.

2. A method for continuous preparation of a hydrous zirconia sol according to Claim 1 wherein the said aqueous solution of a zirconium salt is heated to 70~100 °C.

3. A method for continuous preparation of a hydrous zirconia sol according to Claim 1 wherein the said aqueous solution of a zirconium salt is heated to 70~100 °C by supplying another heating medium in addition to the said microwave to the said reactor.

4. A method for continuous preparation of a hydrous zirconia sol according to Claim 1 wherein a

solvent constituting the said aqueous solution of a zirconium salt is a mixture of water and at least one alcohol selected from a group consisting of ethyl alcohol, 1-propyl alcohol, 2-propyl alcohol and butyl alcohol; a mole ratio of the said alcohol/water mixture is 0.5~5.0; and a zirconium salt is selected from zirconium oxychloride, zirconium tetrachloride, zirconyl nitrate or zirconium sulfate.

10 5. A method for continuous preparation of a hydrous zirconia sol according to Claim 1 wherein the pH value of a hydrous zirconia sol is 5~12.

15 6. A method for continuous preparation of a hydrous zirconia sol according to Claim 1 wherein the average diameter(d_p) of the hydrous zirconia particles is about 10~150 nm.

20 7. A method for continuous preparation of a hydrous zirconia sol according to Claim 1 wherein the cross sectional shape of the reaction tube is circular or concentric annular form, and the value of D is 0.01~3 cm when a diameter of the said circle or an equivalent diameter corresponding to a concentric annular region is
25 "D."

8. A method for continuous preparation of a hydrous zirconia sol according to Claim 1 wherein a dispersant is added to the said aqueous solution of a zirconium salt at the concentration of 0.05~20 g/.l.

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9. A method for continuous preparation of a hydrous zirconia sol according to Claim 1 wherein the said reactor is partitioned into multiple heating zones.

10 10. A method for continuous preparation of a hydrous zirconia sol according to Claim 8 wherein the said dispersant is at least one selected from a group consisting of hydroxy-propyl methyl cellulose, hydroxy propyl cellulose, sodium oleate, potassium
15 ethylxanthate, poly(acrylic acid), polyvinyl alcohol, polyoxyethylene nonionic surfactant, ethylene glycol, propylene glycol, 2-methyl-1,3-propanediol, glycerol, tartar acid, citric acid, malic acid and lactic acid.

20 11. A method for continuous preparation of a hydrous zirconia sol according to Claim 7 wherein the solvent of the aqueous solution of a zirconium salt in the said reaction tube satisfies the following formula when measuring at the temperature of 25°C:

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$$\rho \cdot u \cdot D / \mu \leq 2,000$$

wherein, ρ represents the density(g/cm³) of the solvent,

μ the viscosity(g/cm·sec) of the solvent, u the average flow velocity(cm/sec) of the solvent, and D the diameter or the equivalent diameter of the cross section.